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Crew Endurance Management Newsletter

an information resource about the Crew Endurance Management System (CEMS) for its practitioners and those interested in learning more about it

Crew Endurance Resources

Welcome to the Crew Endurance Newsletter. We've made some format changes, but continue to bring the same quality of sleep and endurance-related information to support your personal knowledge of Crew Endurance Management and implementation.

READER INTERFACE NOTE:
When reading on the Internet, the symbol to the right indicates a hyperlink for the subject matter indicated in blue, underlined text. Readers with printed copies can visit our website for more information:

http://www.uscg.mil/hq/g-m/cems/index.htm

Much of the information in this issue was originally printed in the National Sleep Foundation's weekly *Alert* – if you'd like to receive this information regularly, sign up with them here – it's free!

Please be sure to pass this information along to others so that they can register with us.

This Issue:

Risk Factor Spotlight: Poor Diet

by LT Samson Stevens, CSCS

In our last issue, we discussed the Crew Endurance Risk Factors of *Long Work Hours* and *No Opportunities to Make up Lost Sleep*. In this issue we will discuss in more detail *Poor Diet*, and appropriately so! See the "CEMS and Your Health" section to see why.

For a review of all 15 Crew Endurance Risk Factors, see the following link to the Decision Support Worksheet:

Crew Endurance Risk Factors

Poor Diet

So what is a poor diet anyway? Seafarers often contend that some of the best "diets" they had included plenty of chicken-fried steak and gravy, mashed potatoes, buttermilk biscuits, and a salad loaded with lots of blue cheese dressing. Although this may sound good to some, it's certainly not good *for* you! In fact, did you know that the U.S. Surgeon General has predicted that obesity will soon surpass tobacco use as the **number one** cause of *preventable* deaths in the United States? Take note that these deaths are PREVENTABLE and that our own dietary choices have a significant impact on our long-term health and endurance.

Though we could write several newsletters devoted entirely to nutrition, we will instead highlight some basic elements to help you sleep better, feel more alert, and reduce the increasing risk of metabolic-related illnesses we're seeing in society today: obesity, cardiovascular disease, type II diabetes, and high cholesterol, to name a few.

When dietary recommendations come to mind, many of us think of the U.S. Department of Agriculture's Food Guide Pyramid, which has been promoted for years as the right way to eat. Interestingly, the USDA guidelines have recently been revamped, especially in light of our nation's downward spiral towards obesity. The recommendations below are derived from several examples of tried-and-true practices from within the health and fitness community:

1. Eat 5-6 times per day: Most of us were brought up to eat breakfast, lunch, and dinner – and usually dinner was the largest meal of all. This particular model of eating puts us on the fast track to weight gain and decreases sleep quality. Eating a large meal before going to bed is one of the worst things you can do for your health and sleep because it overloads your body with huge amounts of food that is usually stored as **FAT**. Eating smaller, more frequent meals (every 2-3 hours), stimulates the metabolism through increased digestive activity. Just don't take this recommendation as license to eat your usual three square meals PLUS snacks in between every meal!

2. Eat protein, carbohydrates, and healthy fats with every meal: These are the three components of every food. How do you figure out which nutrients comprise which foods? Well, you need to engage in some self-education and start reading labels. Very briefly, foods containing protein (continued next page)

Poor Diet (continued from p.1)

are usually animal products (meat, dairy, and eggs), and to a much lesser degree, nuts, legumes, and grains. Carbohydrates are in EVERYTHING *but* the animal products listed above. Fat is a little tougher to generalize, but can be found in all oils, most animal products, nuts, and some vegetables. While it's easy to identify individual foods and their respective macronutrients, it gets more difficult when you have meals or foods made up of a variety of these components. At this point, the nutrition label is the easiest method of determining how much of each component is in the food.

3. Eat healthy fats (in appropriate amounts): Significant attention has been given to "bad" fats in recent months. These are the partially and fully-hydrogenated oils (**trans-fats**) contained in most snack foods, pre-made frozen meals, and just about anything found outside the produce, dairy, or meat sections of the grocery market. In fact, products are now required to report the quantities of these trans-fats in foods. So again, it comes down to reading labels and self-education. Stick with mono- and poly-unsaturated fats and leaner cuts of meat and lower-fat dairy products – and pay attention to "appropriate amounts!" Even if something is a "healthy" fat, that doesn't give you free reign to douse everything in olive oil, or eat an entire jar of nuts. Fat has more than twice the calories of protein or carbs! Though we've come a long way since the "fat-free" craze, we still need to recognize that the good ones must be eaten in moderation.

4. Minimize processed carbohydrates/ choose fruits and vegetables: Processed carbohydrates are a sad chapter in the story of our health and food production progress in general. These consist of anything, once a whole grain, that has subsequently been ground up into miniscule pieces and then reconstituted into processed foods such as crackers, chips, cold cereals, cookies, pasta, and bread. Our bodies were never intended to consume these foods – that's why we have our own grist mill in the form of our molars! Judging by the continually rising obesity rates among all age groups, the effect of these types of foods is readily apparent in our society today.

Choose whole grains when you can instead, or, better yet, reduce your overall grain consumption and substitute with vegetables and fruits – real foods that we actually chew.

5. Reduce processed sugars: A single can of soda has about 150 calories and 40 grams of sugar. Add that up during the day, and four cans later, you'll find you've consumed 600 calories and 160 grams of sugar in beverages alone! An easy fix to reduce your overall calorie intake is to choose calorie-free drinks, the best choice of all being water. Processed sugars also include fruit juices in which the healthy fiber has been removed, as well as anything that contains corn syrup – think sauces, snack foods, cereals, and soft drinks. Once again, these are products you'll find everywhere BUT the produce, dairy, or meat sections of the grocery market.

Deaths as a result of obesity are *PREVENTABLE*, and our own dietary choices have a significant impact on our health

6. Drink plenty of water: Up to 60 percent of the human body is water. The brain is composed of 70 percent water, blood is 82 percent water, and the lungs are nearly 90 percent water. The cells in our bodies are full of water. Almost makes you thirsty just reading those numbers, doesn't it? Notice, the component here is *water*….not coffee, tea, soft drinks, juice, or anything else. While all these other drinks *contain* water, they're not an adequate substitute. In fact, drinks containing caffeine aid in the *removal* of water (diuresis). Unfortunately, our bodies' thirst mechanism is very poorly designed, so by the time we feel thirsty, we are already dehydrated. The best strategy to prevent this is to keep a water bottle with you whenever you can, and to drink at least eight, 8-ounce glasses of water per day. This need will increase depending on your levels of physical activity, perspiration, and your work environment.

Finally, although not technically considered part of our diet, the potential effects of oral over-the-counter (OTC) medications also fall under this risk factor. Be sure to read labels when taking cold and allergy medications, as many of them contain either pseudoephedrine or diphenhydramine hydrochloride. **Pseudoephedrine** is found in decongestants and causes alertness similar to caffeine, so it's not a good idea to take this before going to bed. On a similar note, limit substances containing caffeine 3-4 hours before sleeping to prevent a reduction in the quality of your sleep. **Diphenhydramine hydrochloride**, which is found in antihistamines for allergy relief and some cold/sleep medicines, causes drowsiness. It would not be a good idea to take this right before going on watch.

These guidelines are by no means an exhaustive list, and we have merely scratched the surface of the subject. These recommendations form a foundation of nutritional strategies that encourage health and endurance. Whether you choose to incorporate none, some, or all of these recommendations is up to you. Remember, CEM is not about forcing people to eat differently, but rather to provide them with both the knowledge, *and the choices,* in their work environments to make healthier eating possible. It's through education like the principles stated here, as well as in Coaches Training, that individuals realize the consequences of eating poorly, and the benefits of eating well!

Although there is a wealth of information available on the Internet, a good place to start might be the American Dietetics Association's website:

www.eatright.org

CEMS and Accident Prevention

Fatigue Away From the Job—Who's Responsible?

Heather Brewster spent several months in a coma after she was severely injured in a car crash. Her vehicle was struck from behind by a medical resident at Rush-Presbyterian-St. Luke's Medical Center in Chicago. The doctor fell asleep at the wheel of her car after being on duty at the hospital for 34 hours.

When the case went to trial, the Medical Center was named as a defendant, but the Court ruled that hospitals cannot control the actions of their employees after they leave work. However, The Committee on Interns and Residents has formally requested that the 1st District Appellate Court in Cook County, IL reconsider the decision, arguing that **hospitals have a responsibility to ensure that a medical resident's ability to function while at work or driving home is not impaired by sleepiness or fatigue that result from excessive work hours and scheduling practices.**

According to the plaintiff's attorney, "We don't want the hospitals to 'control' residents after they leave work. Instead we want the hospital not to impair the resident's ability to function while the resident is at work, so that he or she will cause injury after leaving work." (Original article printed at the National Sleep Foundation's website).

Although the title question has not been answered, it's clear this issue is becoming more prevalent in today's sleep-deprived world! In fact, in 2003, the state of New Jersey gave the nation its first law (known as Maggie's Law for the woman that a fatigued driver killed) specifically stating that a sleep-deprived driver is a reckless driver who can be convicted of vehicular homicide. Read more about Drowsy Driving and what you can do about it here.

Long Work Hours and Human Error

In our last issue, we discussed the correlation between work shifts longer than 12 hours and hospital nurses' errors. To continue this discussion, a recent study has shown that medical interns are less than **half as likely to commit attentional failures** when on a restricted work schedule (less work, more sleep) than those on a traditional schedule. What's amazing is the definition of "restricted": a maximum of 24 hours of work at one time, and work weeks not to exceed 80 hours! Based on the results of this study, Brigham and Women's Hospital in Boston has begun implementing a new policy that regulates the shifts of first-year interns by restricting:

- **Work** to *80 hours or less* per week.
- **Shifts** to *24 hours or less*.
- **Assignments** such that, *after 18 hours* of continuous work, they *cannot write orders* for patient care activities.

Obviously, endurance is not just for the maritime industry, as many have pointed out during Coaches Training sessions in the past year. For more on this study, check out the New England Journal of Medicine.

What's amazing is the definition of a "restricted" work schedule for medical interns: a maximum of 24 hours of work at one time, and work weeks not to exceed 80 hours!

Real-World CEMS Improvements

Vibration-Reducing Surfacing

We've often pointed out the use of window shades and door baffles as methods of reducing outside light and noise in crew cabins. We all know that environmental improvements encompass far more than just this.

Vibration reduction is a significant improvement to sleeping quarters and general habitability. While significant structural changes may be more effective, anti-vibration matting and materials may be a viable alternative to existing vessels. Correctly done matting can provide anti-fatigue, anti-vibration, increased traction, noise reduction, electrical safety, and general ergonomic musculoskeletal benefits.

While not an advertisement or endorsement, we include the following

examples of vibration isolation as an example of potential crew endurance plan components:

Vibration Isolation

Noise Reduction Matting

Anti-Fatigue Mats

More Mats

CEMS and Your Health

Sleep and Obesity - A Connection?

Although we originally brought your attention to this connection in last year's Newsletter Issue #3, a more recent study published in the Journal of Clinical Endocrinology and Metabolism shows that sleep duration is associated with human leptin levels. Leptin is a hormone that plays a role in balancing signals for calorie intake with energy expenditure, possibly making you feel like you need to eat more and potentially leading to resulting weight gain. In the study, when eleven healthy 22-year-olds were restricted from 12-hour bedtimes to four-hour bedtimes, maximum leptin levels were 26% lower.

A follow-on study conducted in the Clinical Research Center at the University of Chicago corroborated these results and found the participants' response to sleep restriction was associated with a 24% increase in hunger and a 23% increase in appetite. The study also found that participants' appetite for calorie-dense, high-carb foods like sweets, salty snacks, and starchy foods increased by thirty-three percent, jumping from 12% to 45%.

Also available is the press release presented at the North American Association for the Study of Obesity (NAASO), in which studies showed that subjects between the ages of 32 and 59 who slept four hours or less per night were 73% more likely to be obese than those who slept between seven and nine hours per night:

NAASO Press Release

It's a good thing we wrote about Crew Endurance Risk Factor #8 this issue!

Feeling Down? Get More Sleep!

An article in the September issue of *Sleep Medicine* (Volume Five, Issue Five, Sept. 2004, pp 441-448) shows that sleeping more can apparently eradicate "sleep debt" and result in improvements in **reaction time, mood, and levels of daytime alertness**. The fifteen healthy college students participating in the study were required to sleep as much as possible over a prolonged period.

As the subjects obtained additional sleep, measurements of reaction time, mood, and daytime alertness improved significantly. Sleep duration increased from a baseline average of 7.01 hours to as much as 9.37 hours in the first days of extended sleep, with an average of "satiation" at **8.15 hours**. Sounds pretty close to the average human sleep requirement of 7-8 hours, doesn't it?

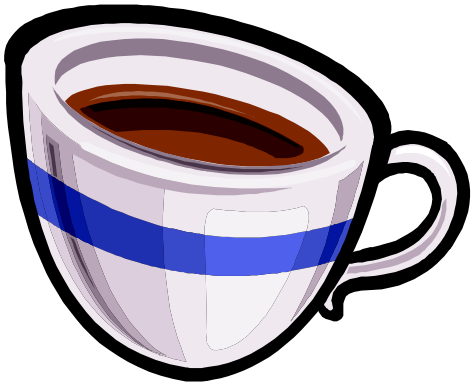
Another Reason to Lower Your Daily Dose of Caffeine

A recent American University review and analysis of caffeine consumption over the past 170 years "demonstrates that when people don't get their usual dose [of caffeine] they can suffer a range of withdrawal symptoms, including headache, fatigue, decreased energy/activeness, decreased alertness, drowsiness, decreased contentedness, depressed mood, difficulty concentrating, irritability, and foggy/not clearheaded. They may even feel like they have the flu with nausea and muscle pain." Furthermore, the onset of symptoms occurred 12-24 hours after abstinence, with peak intensity at 20-51 hours, and for a duration of **2-9 days**. In general, the incidence or severity of symptoms increased in correlation to one's level of daily dosage.

What's the lesson here? If you're a lifetime coffee drinker, it may not be so much that you *like* it, but that you *need* it! And if you're going to try to cut back, you might want to do it SLOWLY or be prepared to face the side effects! Read more about the study here.

How Much Caffeine Do You Actually Use?

The National Sleep Foundation's caffeine calculator can help you determine how much caffeine you get from the foods, drinks, and over-the-counter medications you consume throughout the day.



CEMS in the U.S. Coast Guard

Personal Experiences Aboard the *USCGC Boutwell*

by CAPT Scott Genovese

As we've reported before, CEM is being implemented within the Coast Guard. We take time to share with you here the experiences of implementation on a Coast Guard cutter:

We started using CEM as a system after returning from a patrol in the Persian Gulf. Meeting the mission objectives of this patrol exposed us to many ***endurance risk factors,*** and by the end of the patrol, it seemed like every department on the ship had its own work schedule to meet operational challenges. We recognized our exposure to these operational risks and knew we had to address them proactively. So, when the Coast Guard's Research and Development Center (R&DC) and Headquarters Office of Safety and Environmental Health (G-WKS) approached us to implement the CEM system as a demonstration project, we looked at it as a chance to set up a better watch system. I just said, "Tell me what to do!"

From the onset, the R&DC and G-WKS teammembers stressed the importance of ***vertical alignment*** for CEM interventions to succeed. That is, commitment to CEM must occur at all levels —- top-to-bottom and bottom-to-top — of the ship. Though support from the top-down is important, our change was really driven from the bottom-up. **Twenty-seven crewmembers** stepped up and volunteered to participate in the ***CEM Working Group***- and stuck with it for the entire year! Working group members were taught the basics about sleep and endurance. They were also shown tools to identify and control endurance risk factors. The working group was very active aboard the ship by sensitizing the remainder of the crew to sleep and endurance issues, keeping the crew informed about the activities of the group, and soliciting input on ideas and efforts to improve endurance. The working group acted as the catalyst to keep CEM moving forward aboard the ship. Their activities produced high levels of buy-in and a sense of ownership among the ranks, and I think that after the chaos of the Gulf, they were genuinely happy that someone from the outside cared about their well-being.

The working group was educated on the 5 steps of the CEM system:

I. Set up a Crew Endurance Work Group (CEWG): This first step was already complete. The working group now had to work on the next four steps: ***analyze the current situation, develop a crew endurance plan, implement the crew endurance plan***, and, at the fifth step, ***evaluate the results***.

II. Analyze the current situation: Using the Decision Support Tool (DST) software, the working group assessed their exposure to the 15 endurance risk factors. The risk assessment showed high exposure to all the risk factors, but the following factors were of most concern to us:

- **sleep lengths less than 7 hours**
- **poor sleep quality**
- **sleeping during the day**
- **fragmenting the sleep period**
- **high stress and workload**

III. Develop a Crew Endurance Plan (CEP): Using the risk assessment results, the working group explored ways to control or mitigate these risks. A CEP was developed and presented to senior cadre for blessing. Some of the controls included:

- **stabilizing the watch schedules**
- **reducing noise and improving the sleep environment**
- **using light to help the crew adapt to night work**

CEMS is the only program we've seen with scientific data to question the traditional approach.

IV. Implement Crew Endurance Plan: After the plan was accepted by the senior cadre, the plan was implemented. Not all the changes went smoothly. In general, crews hate when you change their routine. A 1-4 watch schedule (4-hour watch followed by 12 hours off-watch) was normal for them, and they liked it! But we learned from the CEM team that 1-4 schedules disrupt human physiology – similar to what you experience with "jet-lag." This is because each day, you are standing a later watch, and it's like asking people to travel multiple time-zones every day. This kind of watch produces feelings of sluggishness, poor focus and mood, and decreased performance. Given our crew resources, we opted to change to a 1-6 watch schedule (4-hour watch followed by 20 hours off-watch) which maintains the body's 24-hour rhythm. It took some getting used to the 1-6 watch schedules because it was difficult to coordinate all the ship sections. However, I found an added benefit to less flexibility in scheduling such watches. Since there is less of a pool of officers to plug into a 1-6 watch schedule, most crewmembers found themselves routinely working with the same people, making for a more cohesive team.

In a ***break from tradition***, taps (22:00) and reveille (06:30) announcements were eliminated, and regular announcements during the evening and morning were limited to passing critical information. These changes were used to reduce noise in the environment and improve sleep quality. Eliminating these all-hands messages protected the sleep of members standing the 00:00 – 04:00 watch, since they try to sleep before and after their watch when these announcements occur. The crew actually missed the announcements throughout the day and missed the background noise – the bells and meal announcements marked their day. Another problem we worked through was waking members who usually got up with reveille at 06:30. Without it, some of them missed getting up to report for duty at 08:00!

The working group continued to meet on a regular basis and helped us work through rough points and evaluate what we needed to work on next. We eased into using ***light management*** to help the crew adapt to night watchstanding. The CEM team instructed us on how to use light to adjust the biological clock to improve alertness. ***Light sources in the green wavelength were used because they provide a stronger signal to the biological clock in the brain***, and although night vision is affected, its degradation is less so than with white light. The green light was installed in the mess deck, engineering, and the chart table on the bridge. Engineering sections kept the light on throughout the night watch because night vision was not an issue. Bridge watchstanders were exposed to the green light for 15-20 minutes prior to their watch while having a snack in the mess deck, and could go to the chart table to get additional exposure.

Training was typically conducted in the afternoon, but after the schedule changes, we shifted the training to the morning. This proved to be a change for the better – the crew was more receptive, they absorbed more, took responsibility for their work, and still got a good night's sleep.

The crew's number one complaint was the racks! If we could have purchased new mattresses and renovated the berthing areas, we would have. Unfortunately, (continued next page)

USCGC Boutwell (continued from p.5)

you're not always going to have the resources, or the even the space, to make changes like that. We did what we could, and had to just keep the rest on our list as a future possibility.

V. Evaluate the Results: The controls were in place for a few weeks when the evaluation was conducted to see if they produced desired benefits. The evaluation results were a little surprising. As expected, changing from the 1-4 watch to the 1-6 produced stable sleep/wake patterns that maintained the body's 24-hour body rhythms. Surprisingly, although the sleep length for the 1-6 night watchstanders was longer than for the 1-4 watch, it was still ***less than 6 hours*** per night most of the time. In our case, this was because the 09:30 wake-up time for late sleepers was too early and only allowed the mid-watch to get approximately 5 hours of sleep per night. This demonstrated that **even with a good schedule, you may not get the results you expect** because ***other factors in the work system can work against you*** … in our case, it was the late sleeper wake-up time.

Sleep quality was improved because of the efforts to reduce noise. The green light did improve the alertness of the crew on the night watch. The engineering department kept the green lights on the entire watch but complained that the lights gave them headaches, interfered with some of the displays, and that it actually made them feel more tired. When we compared the results from engineering with those working on the bridge, who were only exposed for 20 minutes prior to the watch, we did not see any differences. **Getting the 20 minute exposure is enough to get the benefits, certainly easier to implement, and the crew will have less ill feelings.**

For us, CEM reduced our exposure to endurance risks. There were some members who questioned the need to change our routine, but you're always going to have skeptics aboard who challenge, "How dare you change 100 years of tradition!"

Since the sleep and endurance information in CEM is not common knowledge, we rely heavily on experience and historical/traditional knowledge when planning and executing operations. **CEMS is the only program we've seen with scientific data to question the traditional approach.**

It demonstrates how all the risk factors interact with our biological functions, and has illustrated how the system could change our work schedule for the better. Using human physiology to plan and execute operations should improve crew safety and well-being without compromising mission objectives. I, for one, am glad we recognized our exposure to endurance risk, and that we took this proactive approach to improve the quality of life at sea for the crew, while enhancing our operational readiness.

CEMS Around the World

New Zealand Safety

The New Zealand Maritime Safety Authority (MSA) recently issued a News Release stating that it is leading an industry working group to provide better guidelines and policy for owners, operators, and seafarers to better manage fatigue. Under NZ law, employers are required to have a systematic approach to identifying fatigue-related issues and how to eliminate or minimize their impact. They have identified the negative impact that degraded endurance has on their seafarers and are working to address this issue in much the same way that Crew Endurance Management does.

CEMS Training Update

Coaches Training: Crew Endurance Coaches Training continues to expand via our certified Crew Endurance Expert network. The list below highlights the numbers of Coaches certified by industry Crew Endurance Management Experts:

Kirby:	**79**
Maritrans:	**16**
Seamen's Church Institute:	**19**
Blessey Marine:	**33**
Massachusetts Maritime Academy:	**18**
ACBL:	**174**

Experts Training: Our last Crew Endurance Experts Training was held in Chesterfield, MO November 10-12, 2004. Special thanks go out to AEP-MEMCO (Tim Sizemore and Mike Weisend) for setting it up and hosting the training. Once each of the attendees holds their initial course under Expert supervision, we will have new Experts representing:

ABCD Marine
ACBL
AEP-MEMCO
American Boat
B&H Towing
Crounse Corporation
Ingram Barge Company
Kirby Inland Marine
Madison Coal
Maritime Compliance International
Marquette Transportation
Ohio Valley Marine
Penn Maritime
TECO Ocean Shipping
Weeks Marine

Fatigue Management in Transportation Operations International Conference

Seattle, WA, September 11-15, 2005

This important, timely event will feature internationally-renowned speakers and panelists who will offer industry, research, and regulatory perspectives on current and future research and technologies related to fatigue in transportation operations. The conference is expected to attract representatives from all transportation sectors, industry, university research centers and government agencies from around the world.

The USCG will be attending and presenting several papers/presentations on various elements of Crew Endurance Management both within the Coast Guard and commercial maritime industry.

Please visit the conference's website below to learn more and to find out about co-sponsor opportunities should you wish to highlight your efforts in the maritime industry:

http://www.engr.washington.edu/epp/fmto/home.html

Upcoming Training Sessions

Coaches Training

February 8-9, 2005:
Seattle, WA
(Pacific Maritime Institute)
Contact: Gregg Trunnell
gtrunnell@mates.org
206.838.7422

February 24-25, 2005:
Baton Rouge, LA
(Kirby Inland Marine)
Contact: John Baker
john.baker@kirbycorp.com
713.435.1449

March 1-2, 2005:
New Orleans, LA
(Maritime Compliance International)
Contact: Kevin Gilheany
training@marcomint.com
504.319.3229

April 18-19, 2005:
Paducah, KY
(Seamen's Church Institute)
Contact: Greg Menke
gmenke@seamenschurch.org
270.575.1005

April 21-22, 2005:
Buzzards Bay, MA
(Massachusetts Maritime Academy)
Contact: Ms. Peg Brandon
pbrandon@maritime.edu
508.830.5091

July 6-7, 2005:
Paducah, KY
(Seamen's Church Institute)
Contact: Greg Menke
gmenke@seamenschurch.org
270.575.1005

November 10-11, 2005:
Buzzards Bay, MA
(Massachusetts Maritime Academy)
Contact: Ms. Peg Brandon
pbrandon@maritime.edu
508.830.5091

Experts Training

Our next Experts Training is scheduled for February 16-18, 2005 in Metairie, LA.

Although the class is currently filled, please contact LT Samson Stevens (202.267.0173) if you're interested in attending so he can place you on the wait list in the event of cancellations. We anticipate holding Experts Training sessions every two to three months, with the next training scheduled for sometime in April or May.

Crew Endurance Resources Online

The **Coast Guard CEMS Website** continues to be updated with additional CEM information and resources. Thoughts and suggestions are always welcome regarding content and information. Please forward them to:

fldr-GMSE@comdt.uscg.mil

or call us at 202-267-2997.

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an information resource about the Crew Endurance Management System (CEMS) for its practitioners and those interested in learning more about it

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